I CLAIM AS MY INVENTION:

1. A method for angiographic MRI scanning of a body of a patient lying on a table, using a magnetic resonance imaging apparatus having a basic field magnet that generates a basic magnetic field in a homogeneity volume, said method comprising the steps of:

(a) exciting a slice of said body in a block-shaped volume of the body by excitation with an RF pulse and simultaneous application of a slice-selection gradient switched in a longitudinal direction of the body so that, at a beginning of the excitation, the block-shaped volume is disposed at an edge of said homogeneity volume and with a width of the block-shaped volume in said slice selection direction being smaller than a maximum possible field of view of the excitation;

(b) spatially coding said block-shaped volume by applying a phase-coding gradient in said slice selection direction and applying a frequency-coding gradient in a plane that is vertical relative to the direction of the phase-coding gradient;

(c) uniformly and continuously moving said body by uniformly and continuously moving said table, to move the block-shaped volume uniformly through said homogeneity volume; and

(d) simultaneously uniformly shifting said phase-coding gradient and said frequency-coding gradient in conformity with moving the table so that said block-shaped volume exhibits no motion relative to said table and no motion relative to said patient, until said block-shaped volume is disposed at an opposite edge of said homogeneity volume.

2. A method as claimed in claim 1 comprising repeating steps (a) through (d) to move said field of view relative to said body until a predetermined section of the body is scanned in a plurality of block-shaped volumes.

3. A method as claimed in claim 2 comprising combining data respectively for said plurality of block-shaped volumes to produce an image of said body section.

4. A method as claimed in claim 1 comprising the step of, after exciting said block-shaped volume, scanning said block-shaped volume from different directions.

5. A method as claimed in claim 4 comprising selecting said different scanning directions from the group consisting of a frontal direction, a +45° coronal-sagittal direction, and a -45° coronal-sagittal direction.

6. A magnetic resonance imaging apparatus for angiographic MRI scanning of a body of a patient, comprising:

a basic field magnet that generates a basic magnetic field in a homogeneity volume;

an RF system and a gradient system operated by a control computer to excite a slice of said body in a block-shaped volume of the body of the patient by excitation with an RF pulse and simultaneous application of a slice-selection gradient switched in a longitudinal direction of the body so that, at a beginning of the excitation, the block-shaped volume is disposed at an edge of said homogeneity volume and with a width of the block-shaped volume in said slice selection direction being smaller than a maximum possible field of view of the excitation, and for spatially coding said block-shaped volume by applying a phase-coding gradient in said slice selection direction and applying a frequency-

coding gradient in a plane that is vertical relative to the direction of the phase-coding gradient; and

said control computer uniformly and continuously moving said body by uniformly and continuously moving said table, to move the block-shaped volume uniformly through said homogeneity volume, and simultaneously uniformly shifting said phase-coding gradient and said frequency-coding gradient in conformity with moving the table so that said block-shaped volume exhibits no motion relative to said table and no motion relative to said patient, until said block-shaped volume is disposed at an opposite edge of said homogeneity volume.

7. A computer program product for operating a magnetic resonance imaging apparatus for angiographic MRI scanning of a body of a patient lying on a table, using a magnetic resonance imaging apparatus having a basic field magnet that generates a basic magnetic field in a homogeneity volume, an RF system and a gradient system, said computer program product being loadable into a control computer of said magnetic resonance imaging apparatus and programming said control computer to:

excite a slice of said body in a block-shaped volume of the body by excitation with an RF pulse and simultaneous application of a slice-selection gradient switched in a longitudinal direction of the body so that, at a beginning of the excitation, the block-shaped volume is disposed at an edge of said homogeneity volume and with a width of the block-shaped volume in said slice selection direction being smaller than a maximum possible field of view of the excitation, and to spatially code said block-shaped volume by applying a phase-coding gradient in said slice

selection direction and applying a frequency-coding gradient in a plane that is vertical relative to the direction of the phase-coding gradient;

uniformly and continuously move said body by uniformly and continuously moving said table, to move the block-shaped volume uniformly through said homogeneity volume; and

simultaneously uniformly shift said phase-coding gradient and said frequency-coding gradient in conformity with moving the table so that said block-shaped volume exhibits no motion relative to said table and no motion relative to said patient, until said block-shaped volume is disposed at an opposite edge of said homogeneity volume.